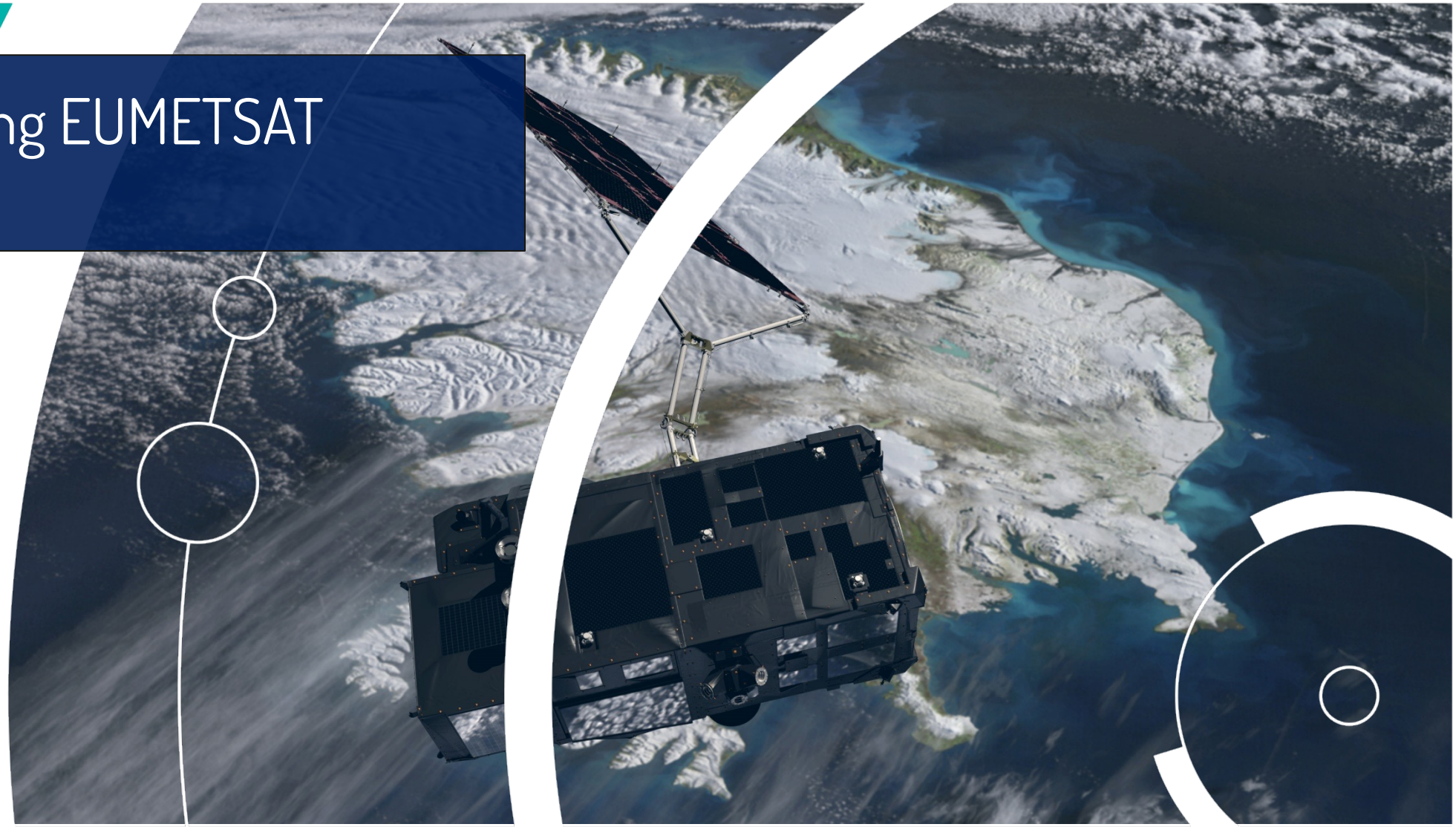
Part 1: Introducing EUMETSAT

Benjamin Loveday



Who are EUMETSAT?

The European Organisation for the Exploitation of Meteorological Satellites.

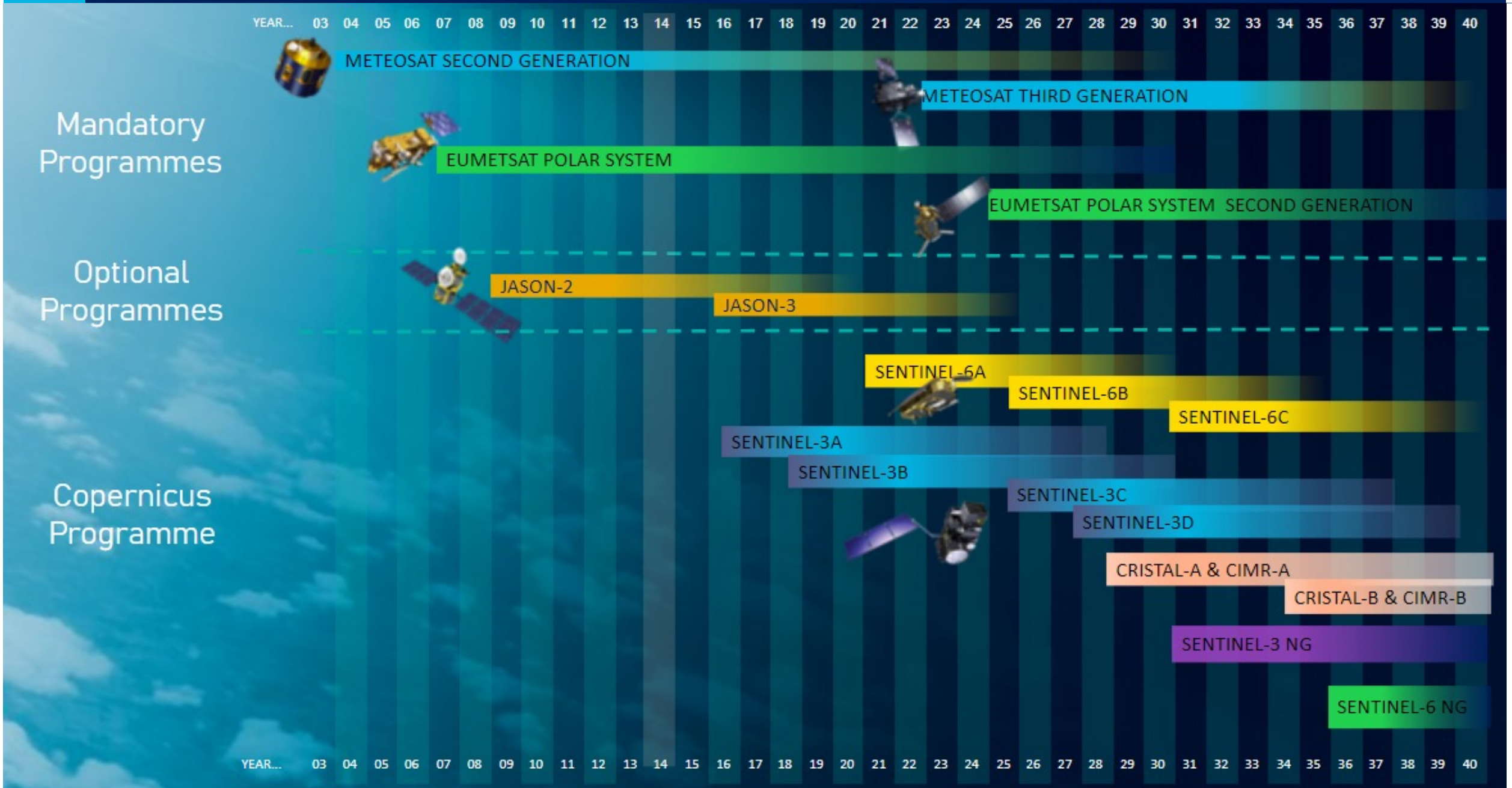
- Located in Darmstadt, Germany
- Founded in 1986, consists of 30 member states
- Two mandates:
    - Weather and Climate data for member states
    - Additional capabilities with EU and beyond:
        - Copernicus programme

Copernicus Europe's eyes on Earth

EUMETSAT OSI SAF OCEAN AND SEA ICE

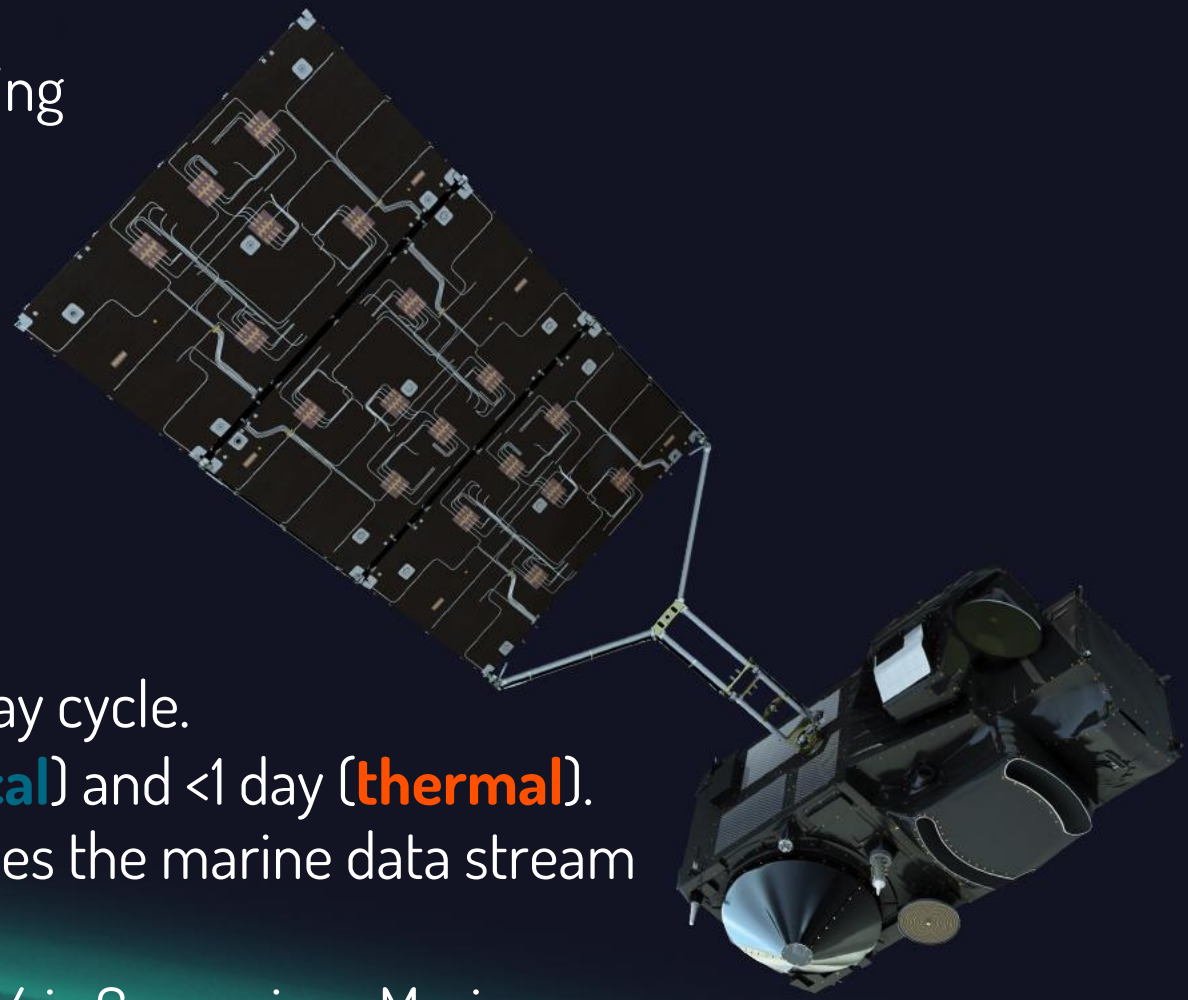
Operational data provider

EUMETSAT missions for marine – current and future



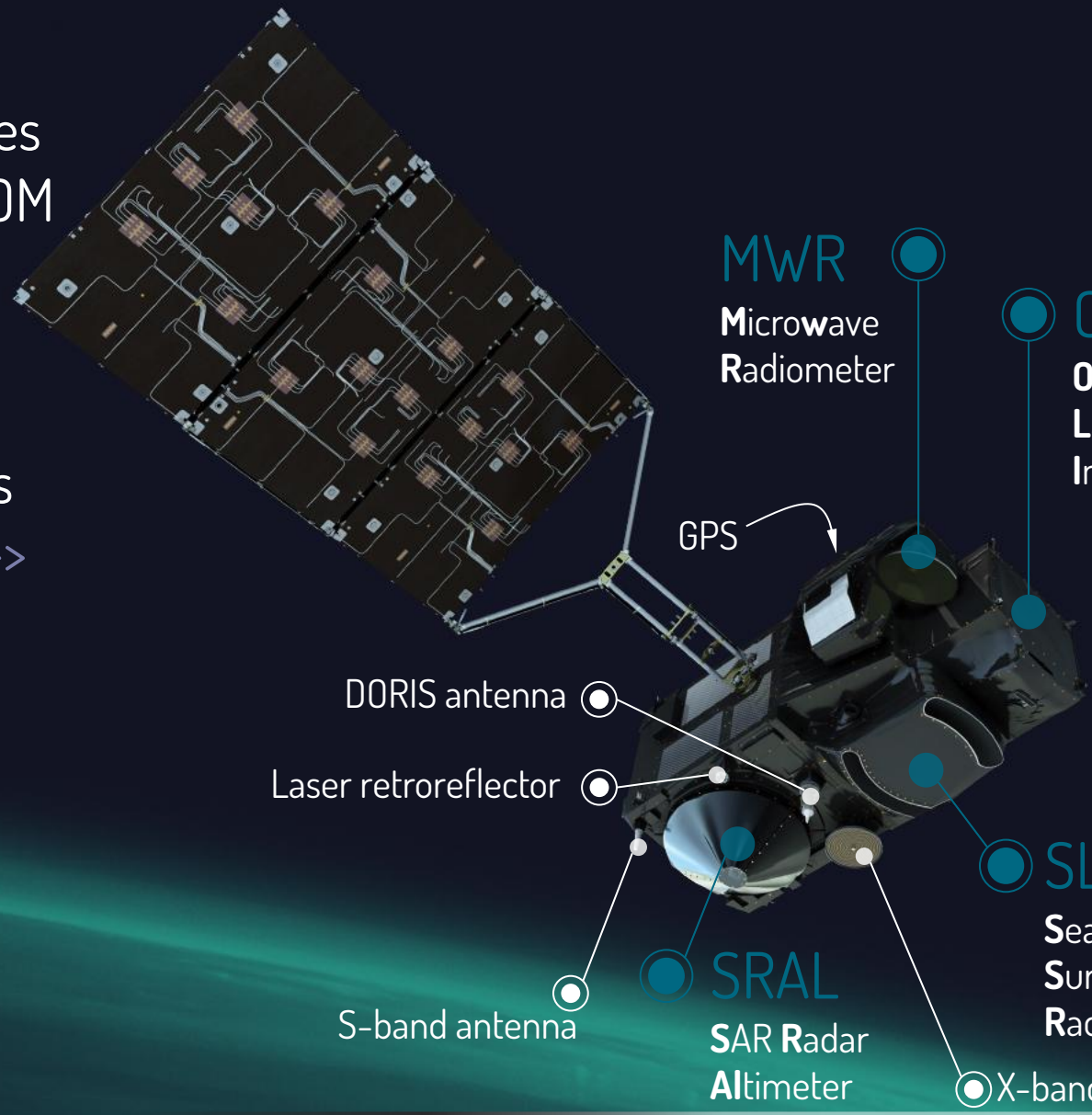
Marine missions: Sentinel-3

- The “blue” sentinel; suite of ocean observing instruments.
- Main objectives: acquire **sea-surface topography**, **sea surface temperature** and **ocean colour data**.
- Constellation of two platforms:
  - Sentinel-3A launched February 2016
  - Sentinel-3B launched April 2018
- Sun-synchronous 98.65° polar orbit, 27 day cycle.
- Near global coverage; <2 day revisit (**optical**) and <1 day (**thermal**).
- EUMETSAT operates the satellite & provides the marine data stream
  - Level-1 and level-2
  - Main user & provider of level-3, level-4 is Copernicus Marine Service
  - Redistributed (and used) by NOAA



Sentinel-3 instruments and variables

- OLCI >> visible radiometry
  - **ocean colour**: radiances & reflectances
  - chlorophyll, suspended sediment, CDOM
  - PAR / kd490
- SLSTR >> thermal radiometry
  - radiances & brightness temperatures
  - Sea and sea-ice surface temperatures
- SRAL / MWR / POD (DORIS/GNSS/LRR) >> surface topography mission
  - Sea surface height
  - Significant wave height
  - Wind speed

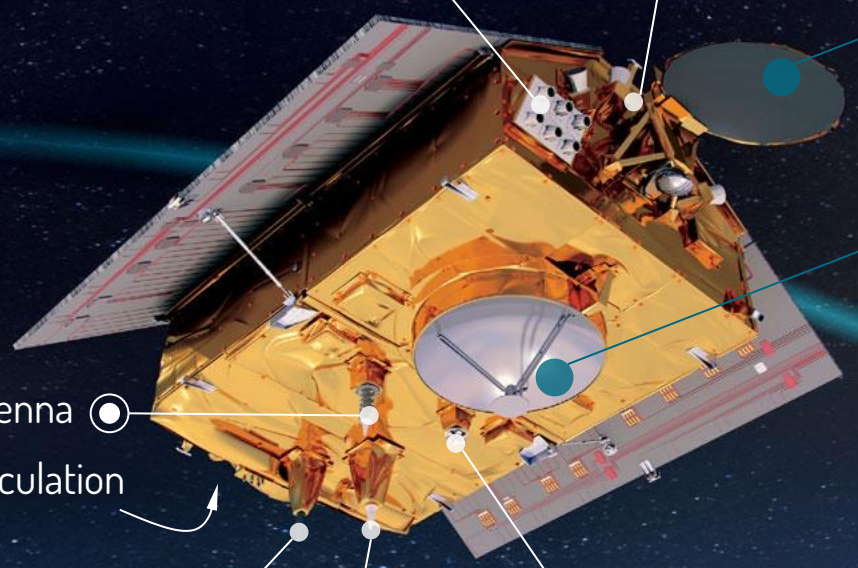


Marine missions: Sentinel-6

- The current **altimetry reference mission**
- Main objectives: high precision **sea-surface topography** measurements.
- Will continue the altimetry record into the next decade(s).
- Constellation of two platforms:
  - Sentinel-6A launched November 2020
  - Sentinel-6B launched planned 2025
- Non-sun sychronous 66° polar orbit, 10-day cycle.
- Collaborative mission: EUMETSAT / ESA / NASA / NOAA
- EUMETSAT operates the satellite & provides the data.
  - Level-1, level-2, level-2P/3 (through CNES)
  - Also available via PO.DAAC

Sentinel-6 instruments & variables

- POS-4 / AMR-C / POD (DORIS/GNSS/LRR) >> surface topography mission
  - Sea surface height
  - Significant wave height
  - Wind speed
- POS-4 ;
  - back compatible (climate continuity)
  - state-of-the-art (open burst transmission, low noise, improved resolution)



Aside #2: satellite levels

- What do we mean by satellite levels?

Processing Level	Description
Level 0	Reconstructed, unprocessed instrument and payload data at full resolution, with communications artefacts removed. Not distributed.
Level 1 (a+b)	Reconstructed, unprocessed, top-of-atmopshere instrument data at full resolution, time-referenced, and annotated with ancillary information.
Level 2 (+p)	Derived geophysical variables at the same resolution and location as Level 1 source data. Usually atmospherically corrected.
Level 3	Variables mapped on **uniform space-time grid scales**, usually with some completeness and consistency. Except topography (L4)
Level 4	Model output or results from analyses of lower-level data (e.g., variables derived from multiple measurements, gap filled, temorally aggregated)

NOTE: There are differences in how parts of the remote sensing community define processing levels. And different instruments will include different methods at each level. Look at individual handbooks, product guides, ATBDs etc for more information.

More information: User Support and Training Resources

www.eumetsat.int

EUMETSAT Helpdesk

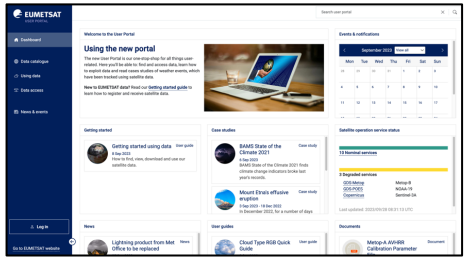
OPS@eumetsat.int

Contact the EUMETSAT helpdesk with any questions about EUMETSAT data products or services

EUMETSAT User Support Resources

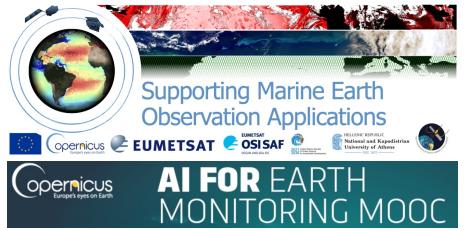
User portal (coming soon)

Copernicus & mandatory missions Data access



Courses

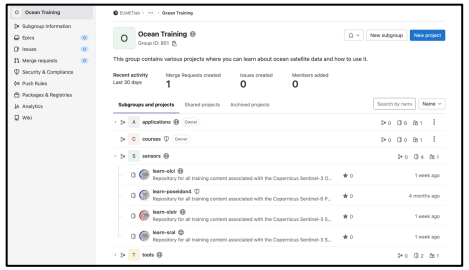
moodle



Code distribution

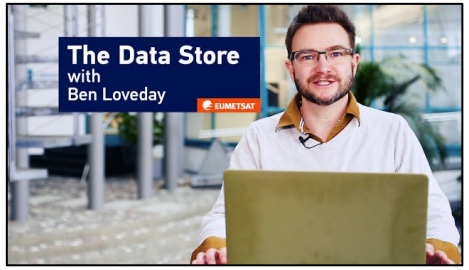
CONDA

GitLab



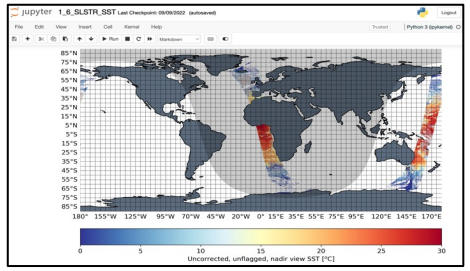
Video tutorials

YouTube



Jupyter Notebooks

jupyter

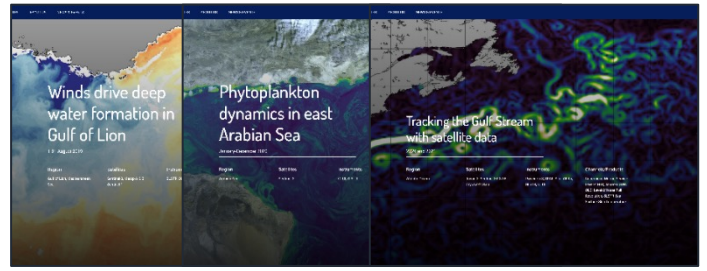


Cloud services

binder

WEKEO

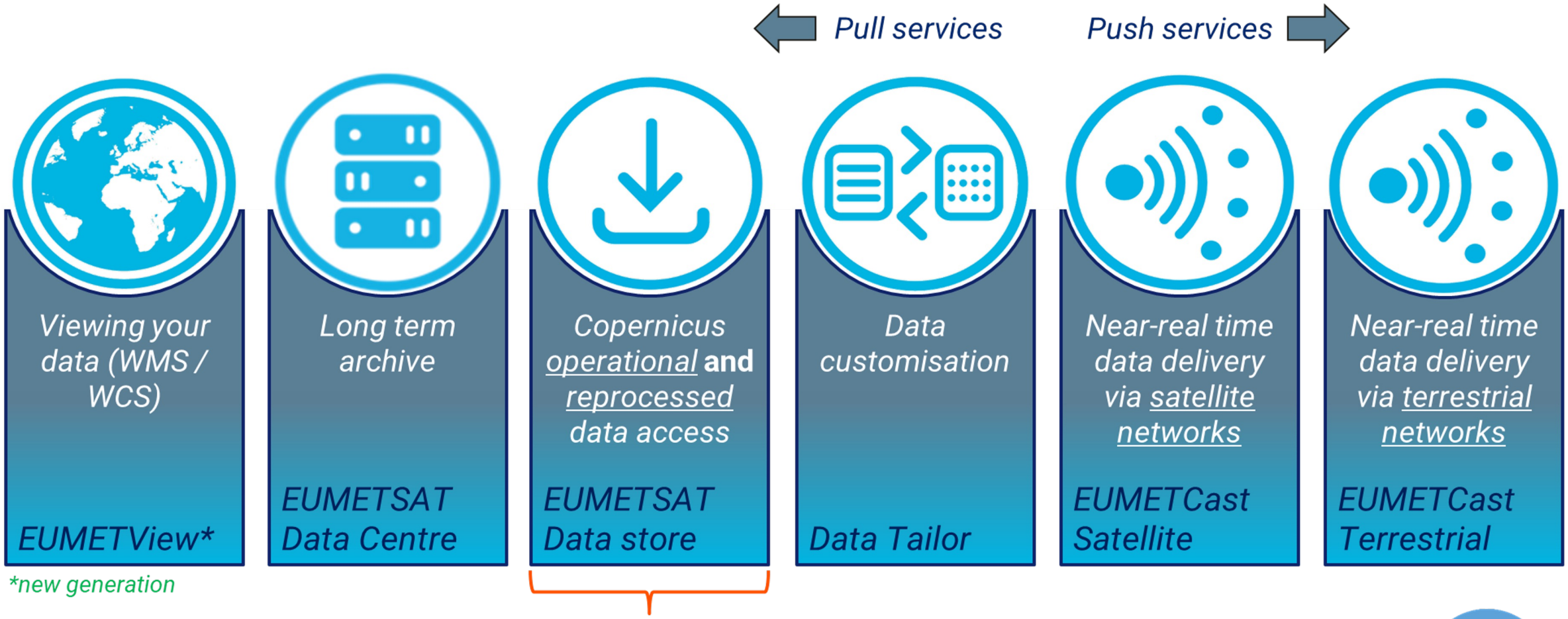
Case studies



Part 1: Accessing and working with EUMETSAT Copernicus Marine Data

Benjamin Loveday

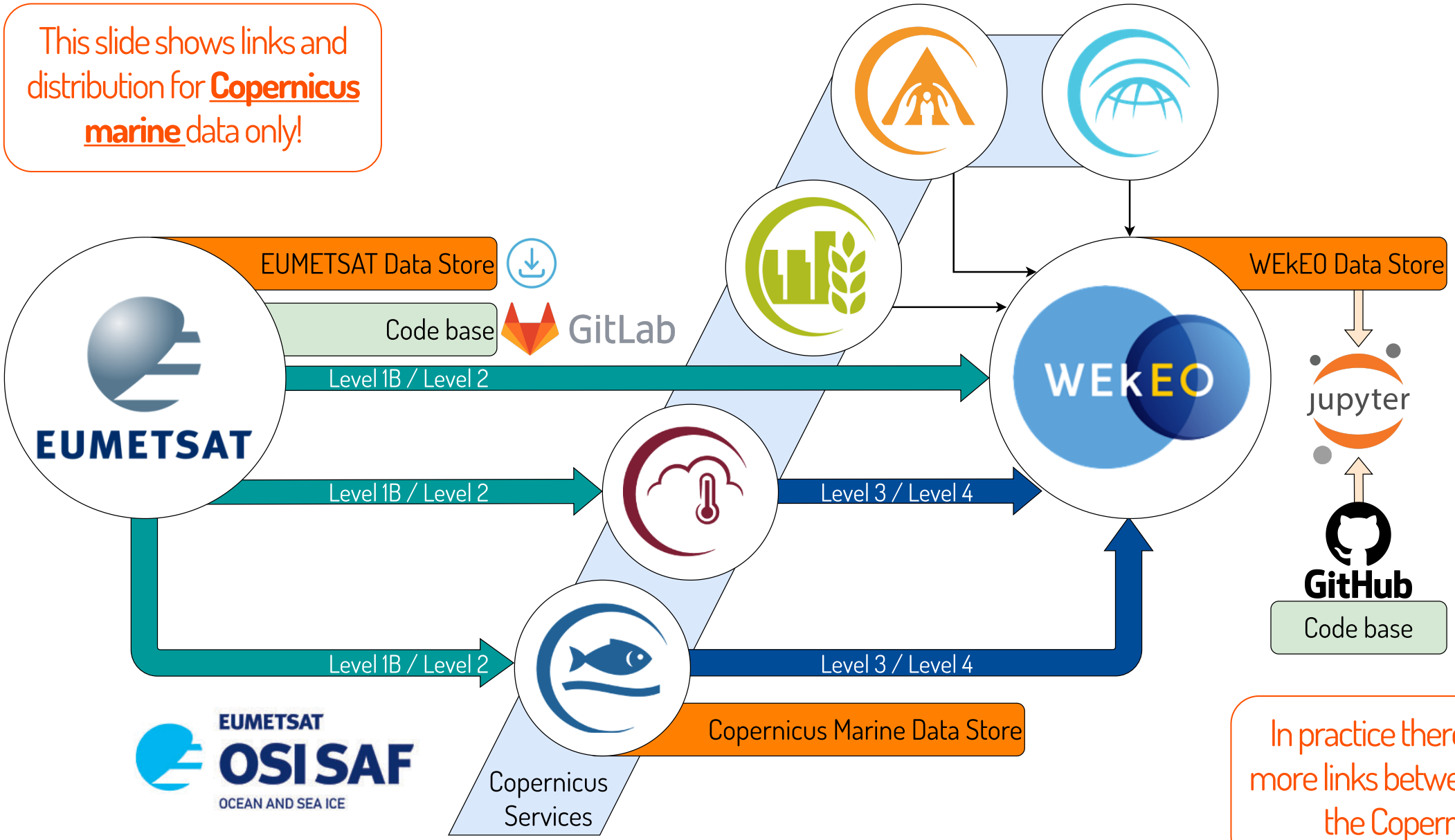
EUMETSAT Data Services



Data Store has replaced the CODA and CODAREP services used by many Sentinel-3 users, offering unified access to operational and reprocessed data. It will allow access long time-series of the most up to data products, via a single point without the use of Data Centre in most cases (including to WEkEO).

EUMETSAT Copernicus marine data distribution

This slide shows links and distribution for **Copernicus marine** data only!

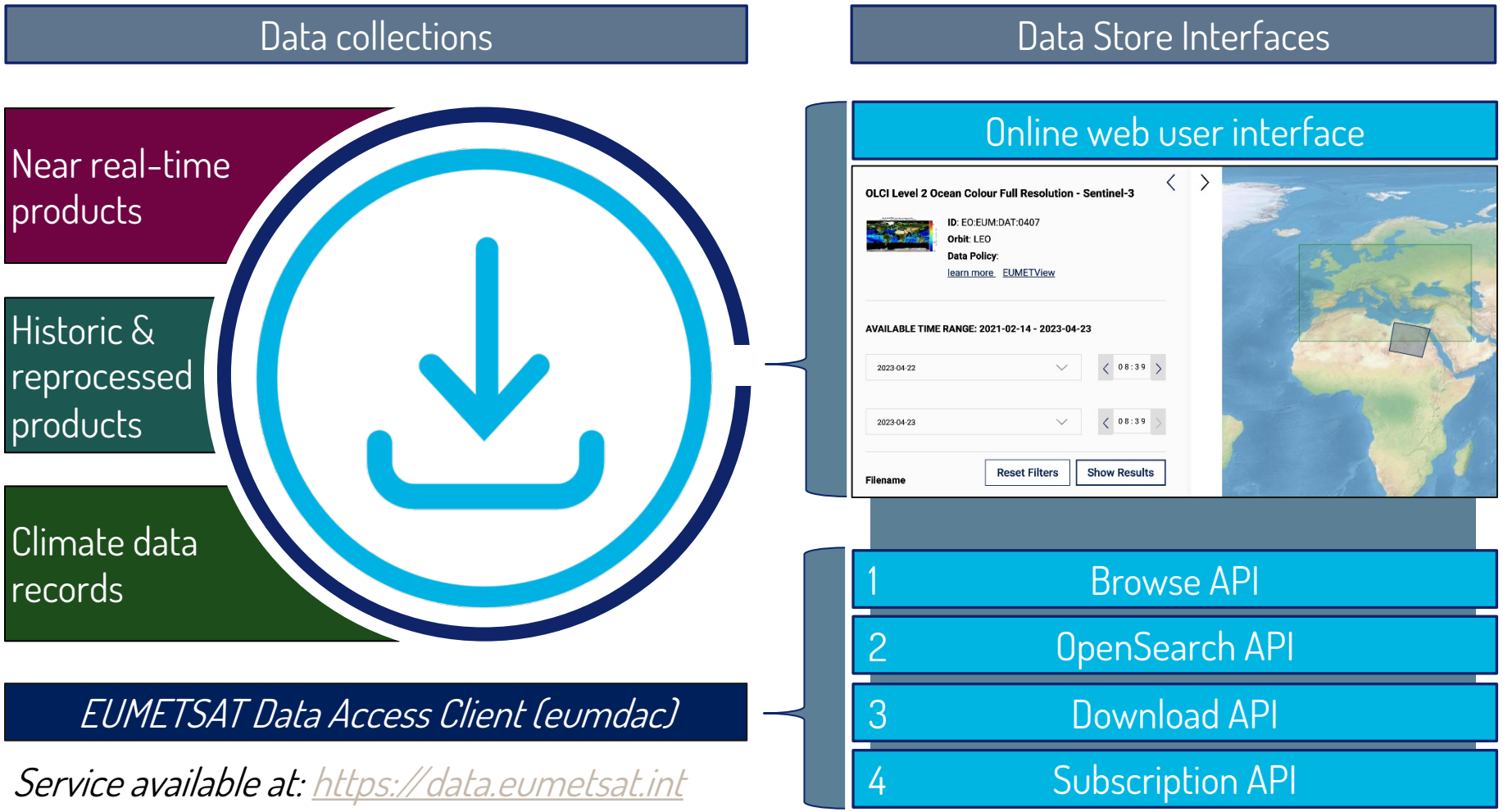


In practice there are many, many more links between EUMETSAT and the Copernicus Services

EUMETSAT Copernicus Marine Data Access using the Data Store

The **EUMETSAT Data Store** provides single point of access to a growing catalogue of EUMETSATs meteorological, climate and ocean data.

- All operational Sentinel-3 data can be accessed.
- Reprocessed data added as reprocessings complete
- For OLCI, a complete level-2 archive is already available.
- Feeds in to WEkEO harmonised data access
- Sentinel-6 reprocessing available, operational feed coming soon.



Advanced data access with EUMDAC

- APIs can be heard to use, so we wrote EUMDAC: (EUMETSAT Data Access Client) to facilitatite automated data access
- Source code available at: https://gitlab.eumetsat.int/eumetlab/data-services/eumdac
- We offer a series of examples showing how to EUMDAC via;
  - Command line (see user guides)
  - Python library – supporting Jupyter notebooks available
- Within the learn-??? repositorys folders we show;
  - Advanced search and filtering options
  - Navigating operational and reprocessed collections to acquire time series
- EUMDAC embedded in ThoMaS toolkit

Data Store GUI demo

Data Store API EUMDAC demo

Thank you!

Questions are welcome.

Contacts and further information

For information on our training programme

training@eumetsat.int

For information on EUMETSAT services

ops@eumetsat.int

For our training calendar

https://trainingevents.eumetsat.int/trui/

More information:

Data Store

Access: https://data.eumetsat.int/

Help: https://eumetsatspace.atlassian.net/wiki/spaces/DSDS/overview

EUMDAC

Source : https://gitlab.eumetsat.int/eumetlab/data-services/eumdac/

Help: https://eumetsatspace.atlassian.net/wiki/spaces/EUMDAC/overview

Gitlab

https://gitlab.eumetsat.int/eumetlab/oceans/ocean-science-studies/ThoMaS

https://gitlab.eumetsat.int/eumetlab/oceans/ocean-training

Training courses

https://trainingevents.eumetsat.int/trui/

Course materials

https://training.eumetsat.int/course/view.php?id=492